USE OF PRE-EXPOSURE PROPHYLAXIS (PREP) TO PREVENT RAPID HIV TRANSMISSION AMONG PEOPLE WHO INJECT DRUGS IN RURAL COUNTIES IN THE UNITED STATES: A MODELLING STUDY

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Background:
Recent HIV outbreaks among people who inject drugs (PWID) in nonurban US communities highlight a shifting epidemiology of HIV. Syringe service programs (SSP) are often inaccessible in rural communities and limited funding for pre-exposure prophylaxis (PrEP) may prompt calls for prioritization of certain subpopulations, such as those with overlapping injection and sexual (dual) risk. We aimed to model the impact of PrEP on HIV transmission among PWID in a rural setting.

Methods:
Using a calibrated agent-based model, we simulated HIV transmission in an adult population (n=23,873 agents) in Scott County, Indiana between 2021 and 2031. We modelled PrEP eligibility according to CDC Guidelines: 1) injection risk, or 2) dual risk. PrEP coverage was set at 40% in each scenario and PrEP efficacy set at 75%. We calculated the number of cumulative HIV infections and number person-years on PrEP (NP-YP) needed to prevent one infection. Sensitivity analyses restricted PrEP to SSP attendees, and PrEP coverage ranged 10–70%.

Results:
In the status quo scenario 153 (95% Simulation Interval: 85, 259) HIV infections occurred among PWID over 10 years. Compared to the status quo, HIV infections among PWID were reduced by 25% and 18% in the injection risk and dual risk scenarios, respectively. The NP-YP was 22 and 25 in the injection risk and dual risk scenarios, respectively. Restricting PrEP access to SSP attendees negatively impacted both preventative effects and NP-YP. Increasing target PrEP coverage to 70% reduced cumulative infections by 36% and 25% in the injection risk and dual risk scenarios, respectively.

Conclusion:
Our modelling suggests that PrEP provides additional benefit to SSP for PWID in rural US communities, with fewer restrictions on access providing the greatest effect. Control of HIV outbreaks will require expansion of existing and novel public health interventions that meet the needs of individuals.

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